June 1976 NSRP 0002

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THE NATIONAL SHIPBUILDING RESEARCH PROGRAM

Proceedings of the REAPS Technical Symposium

Paper No. 9: SPADE Interactive Graphics at Avondale

U.S. DEPARTMENT OF THE NAVY CARDEROCK DIVISION, NAVAL SURFACE WARFARE CENTER

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1. REPORT DATE JUN 1976	2. REPORT TYPE N/A			3. DATES COVERED	
4. TITLE AND SUBTITLE				5a. CONTRACT NUMBER	
The National Shipbuilding Research Program: Proceedings of the REAPS Technical Symposium Paper No. 9: SPADE Interactive Graphics				5b. GRANT NUMBER	
at Avondale				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Surface Warfare Center CD Code 2230 - Design Integration Tools Building 192, Room 128 9500 MacArthur Blvd Bethesda, MD 20817-5700				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFIC	17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF		
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	SAR	8	RESPONSIBLE PERSON

Report Documentation Page

Form Approved OMB No. 0704-0188

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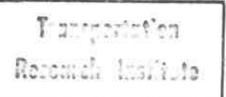




Proceedings of the REAPS Technical Symposium June 15-16, 1976 Atlanta, Georgia

Research and Engineering for Automation and Productivity in Shipbuilding

10 WEST 35 STREET CHICAGO, ILLINOIS 60616



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SPADES INTERACTIVE GRAPHICS AT AVONDALE

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Cali and Associates
Metairie, Louisiana

With over 25 years of experience in the shipbuilding industry, Mr. Cali founded Cali and Associates, a consulting firm for engineering and marine industrial computer applications. Prior to forming his own consulting company, he was Assistant Vice President for Engineering at Avondale Shipyards and Director of Engineering at Litton Ship System. Mr. Cali is a graduate of the Italian Naval Academy.

ACKNOWLEDGEMENTS

The development of a production oriented Interactive Graphic version of the 'SPADES' System for N/C Lofting has been a team effort at Cali and Associates, Inc. with the help of Avondale Shipyards, Inc. personnel.

Special recognition must be given, however, to Mr. Lonnie Lowery of Cali & Associates, Inc. for carrying out the main development load, and to Mr. Lester Vicknair of Avondale Shipyards, Inc. for his help and dedication to the project.

Also, no success would have been possible without the advice and feedback from Mr. Vincent Nuzzo and his people at Avondale's Mold Loft.

GENERAL DESCRIPTION

When the decision was made to proceed with the development of the Interactive Graphics version of the 'SPADES' System, a list of requirements and goals was made.

One of the major considerations was to have total interchangeability between the graphic and the batch mode of the System such that rework could be processed easily, whether the original work had been done through the 'CRT' or in batch. As much as we would like to think otherwise, experience has taught us that changes and revisions are an ever present way of life during the ship design and construction process.

The requirement was also set that none of the 'SPADES' management and control features would be compromised because of the graphic.

In order for the graphic version to be a useful production tool, the user would have the capability of totally checking parts and/or burning tapes generated through the 'CRT' without having to wait for a drafting machine drawing and/or computer printout.

It was also decided that the user would have the capability of switching from one program to another directly from the tube without re-initializing any program at the central computer.

The plans called for four 'CRT's to be on simultaneously, and for at least one batch 'SPADES' program to be also running at the same time. This requirement caused the only major modification of the then existing 'SPADES' System in order to allow different programs to read and write records from the same data base at the same time.

I am happy to report that all of the above requirements have been met. Without going into a detailed description, we achieved this by the simple method of modifying the 'SPADES' System to work either in a batch or in an interactive graphic mode. In fact, the same executable module is called for at all times, regardless of the intended mode of processing the data.

By combining the use of virtual memory capability of the computer and judicious use of overlay, all the applicable programs have been linked together in one executable module. This was made easy by the fact that all 'SPADES' modules - in addition to using the same input handling routines and post processor - make extensive use, also, of common general routines; and therefore, no incompatibility existed between the various modules.

At the time the film was taken, the Shell Development Program had not been linked. This has now been done, and the new version including it is in production use at Avondale.

The development of the software started in September, 1974. The first version, including only the nesting, was put into production use in August, 1975, and the entire project completed in May, 1976.

HARDWARE CONFIGURATION

I. Mainframe Configuration:

IBM 370/158 (Virtual Memory) Actual Core Allocation - 1.5 Megabytes Addressable Core Allocation - 16.0 Megabytes

II. Disk Storage Configuration:

IBM 3830. Storage Control

IBM 3330 Disk Storage Facility

IBM 3336 Magnetic Disk Pack (100 Megabytes Storage Per Pack)

III. Graphic 'CRT' Configuration:

IBM 2840 Display Control Unit

IBM 2944 Data Channel Repeater

IBM 2250 Display Unit (4 Units Per 2840).

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